REMARKS/ARGUMENTS

Claims 1-13 are currently pending. Claims 1 and 9 are amended herein.

Claims 1-13 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,647,663 (Holmes).

Claim 1 is directed to a method for converting a source intensity map into a target intensity map having geometry compatible with a desired multi-leaf collimator configuration. Each of the source intensity map and the target intensity map has a geometry defining sampling points of cells within the maps. The method generally includes: defining a field on an object for radiation delivery; creating an intermediate intensity map geometry such that the intermediate map contains sampling points of the source intensity map and the target intensity map; defining treatment intensity levels for cells of the intermediate map; and calculating treatment intensity levels for cells of the target intensity map based on the intensity level of the intermediate map cells. The field includes a plurality of cells defining the source intensity map and each of the cells has a treatment intensity level. Claim 1 has been amended to clarify that the source intensity map has a geometry that is incompatible with a desired multi-leaf collimator configuration.

Holmes describes a radiation treatment planning method for a radiation therapy machine using a plurality of individually controllable radiation beams directed through a treatment volume. An object of the invention is to take into account limitations in the radiation therapy equipment that limit the number of different intensities it can produce. The system uses a discretization of the weights to a few selected values rather than a continuous range of values. The method includes a user first defining a set of discrete intensity values to which each beam will conform. From an initial weight for each beam, a computed dose map is computed and an objective function value is determined for the computed dose map. This objective function value is compared to an earlier computed objective function value and based on this comparison, the initial weights of

the beams are adjusted. This process is repeated until changes in the objective function are within an acceptably small tolerance defined by the user.

Holmes does not disclose a method for converting a source intensity map, which is incompatible with a particular multi-leaf collimator geometry, into a new intensity map that is compatible with the multi-leaf collimator geometry. Holmes is concerned with selecting an optimal set of beam weights to define the dose intensity for a radiation treatment. Holmes does not disclose creating an intermediate intensity map geometry containing sampling points of a source intensity map and a target intensity map. Instead, Homes starts with a desired dose map and objective functions and performs an optimization process which involves modifying beam weights until a computed dose falls within acceptable user defined limits. Holmes does not discuss modifying the geometry of an intensity map to correspond with a specific multi-leaf collimator configuration.

Applicant's invention, as set forth in claim 1, is particularly advantageous in that treatment planning systems that produce incompatible map geometries can still be used to create intensity maps. Furthermore, a treatment planning system does not have to be reconfigured to provide an intensity map for a multi-leaf collimator having a different geometry. Also, errors in representing a two dimensional function are generally avoided since resampling is used rather than deletion and shifting of cells.

Accordingly, claim 1 is submitted as patentable over Holmes. Claims 2-8, depending directly or indirectly from claim1, are submitted as patentable for the same reasons as claim 1.

Claim 9 is directed to a system for converting a source intensity map into a target intensity map having a geometry compatible with a desired multi-leaf collimator configuration. The system includes, among other things, a processor operable to receive a source intensity map geometry, target intensity map geometry, and treatment intensity levels for cells of the source intensity map, create an intermediate map geometry containing sampling points of the source map and the target map, define

treatment intensity levels for cells of the intermediate intensity map, calculate treatment intensity levels for cells of the target intensity map based on the intensity level of the intermediate map cells, and output the target intensity map. Claim 9 has been amended to clarify that the source intensity map has a geometry that is incompatible with the desired multi-leaf collimator configuration.

Claim 9, and claims 10-13 depending therefrom, are submitted as patentable over Holmes for the reasons discussed above with respect to claim 1.

For the foregoing reasons, Applicant believes that all of the pending claims are in condition for allowance and should be passed to issue.

If any fees are due in connection with the filing of this amendment, the Commissioner is authorized to charge such fees to Deposit Account 19-2179 (Order No. 2001P10894US).

Respectfully submitted,

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